

A NEW MARINE ISOPOD FAMILY FROM THE SOUTH-WESTERN INDIAN OCEAN

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(With 5 figures)

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ABSTRACT

A new family, Bathynataliidae, is created for *Bathynatalia gilchristi* Barnard, a marine isopod crustacean species from deep water off Natal.

CONTENTS

	PAGE
Introduction	41
Systematic discussion	41
Acknowledgements	50
References	50

INTRODUCTION

Barnard (1957) described *Bathynatalia gilchristi* from a single female taken by the R/V *Pieter Faure* in 880 metres off Durban, South Africa. With the brief description, Barnard (1957: 814) stated: 'Taxonomic position doubtful. Superficially somewhat Serolid in appearance, but the similarities and the differences are equally apparent.' Now that nine specimens including both sexes are available, a fuller description can be given and the taxonomic position of this unusual species can be discussed. Several of Barnard's statements can be amended and his diagnosis of the genus expanded.

SYSTEMATIC DISCUSSION

Family **Bathynataliidae** fam. nov.

Diagnosis

Body dorsoventrally flattened. Cephalon anterolaterally expanded, fused with pereonite 1 medially, separated by a deep lateral slit. Pereonites 2 to 7 free, with articulating coxae. Pleon consisting of five pleonites (although these are quite distinct, there seems to be little movement possible between them) plus oval

pleotelson; only pleonites 2 and 3 with elongate lateral extensions. Antennule with 4, antenna with 5 peduncular segments, both flagella multiarticulate. Mandible lacking molar process; incisor broad, lacinia present on right side only; palp 3-segmented. Maxilla 1 curved, armed apically with cluster of spines. Maxilla 2 bilobed. Maxilliped with 3-segmented palp, broad endite, triangular exopod. Pereopod 1 robust and subchelate in both sexes, pereopods 2 to 7 slender, ambulatory in both sexes. Pleopod 1 indurate, exopod and endopod lying parallel, operculate over branchial chamber. Pleopods 2 to 5 biramous, membranous. Uropod subterminal, consisting of single segment, apically obscurely trilobed.

Remarks

Using several keys to the suborders and families of marine isopods (Barnard 1940; Menzies 1962; Schultz 1969), no family (or suborder) can be confidently arrived at for the present material. The species obviously does not belong to the Epicaridea (not being a parasite), the Anthuridea (not having an elongate body-form), the Gnathiidea (not having the characteristic sexual dimorphism of the gnathiids), the Asellota (lacking the characteristic pleopods of this group), or the Valvifera (not having valvate uropods). The pleopods, general disposition of the cutting and biting mouthparts, and the uropods, if one considers them to form a caudal fan with the pleotelson, indicate a flabelliferan affinity. The present material, however, cannot be fitted into any of the existing flabelliferan families, but would seem to be closest to the Serolidae. The similarities include the medial fusion of the cephalon and pereonite 1, both of which are laterally expanded, the structure of the multiarticulate antennules and antennae, the form of the broad incisor of the mandible, the presence of a large lacinia (albeit only on one side), the 3-segmented mandibular palp, the first maxilla (almost identical to such forms as *Serolis completa* Moreira 1971), the bilobed second maxilla (as seen in *Serolis veaperta* Moreira 1971), and the maxilliped structure.

Several differences, however, immediately separate the Serolidae from the present material, and necessitate the erection of a new family for the latter. These differences include the second pereopods of the male (subchelate in Serolidae, ambulatory in *Bathynatalia*), the presence of five rather than three free pleonites, the operculate and non-setose first pleopod of *Bathynatalia*, the fourth and fifth pairs of pleopods (large and operculate in the serolids, delicate and membranous in *Bathynatalia*). Probably the most distinctive feature of *Bathynatalia*, and the most important difference between it and the Serolidae and all other flabelliferan families, is in the uropod. This clavate structure seems to represent an elongate peduncle, with the obscurely trilobed apex possibly representing the apex of the peduncle plus the bases of the rami, represented by two tiny, rounded processes. This interpretation is further supported by the presence of two narrow muscle-bands running the length of the appendage to two of the three apical lobes.

The Bathynataliidae represents the only endemic marine isopod family from the southern African region.

Genus *Bathynatalia* Barnard*Bathynatalia* Barnard, 1957: 814.*Diagnosis*

As for the Family.

Gender

Feminine.

*Type-species**Bathynatalia gilchristi* Barnard, 1957.*Bathynatalia gilchristi* Barnard

Figs 1-5

Bathynatalia gilchristi Barnard, 1957: 814, figs 2-4.*Description**Female*

Integument indurate, bearing numerous fine setules plus numerous elongate plumose setae amongst irregularly scattered tiny tubercles. Body broadest at pereonites 3 and 4. Cephalon lacking eyes; anterior margin hollowed to receive contiguous antennal bases, with low rostrum; anterolateral part lamellar, apically acute; posterior cephalon dorsally convex, irregularly tuberculate. Cephalon and pereonite 1 fused medially, fusion line marked by shallow groove; laterally separated by deep slit.

Fused pereonite 1 expanded laterally into bilobed lamella; anterior part broadly rounded and contiguous with cephalon, posterior part triangularly acute; two middorsal tubercles present.

Pereonites 2 to 4 similar, each with strong middorsal tubercle and elongate articulated coxae.

Pereonites 5 to 6 narrower than preceding pereonites, lacking middorsal tubercles, with elongate coxae.

Pereonite 7 very narrow middorsally, laterally acute but not elongate.

Pleon of five pleonites plus pleotelson; pleonite 1 lacking free lateral margins, pleonites 2 and 3 laterally produced into elongate posteriorly-directed processes; pleonites 4 and 5 short and narrow, lacking free lateral margins, pleonite 4 with middorsal tubercle. Pleotelson longer than broad, with globular proximocentral part bearing reticulate ridges and rounded tubercles, with lateral ridge running from proximal margin to strong distolateral spine, latter situated lateral to uropodal articulation, distal part of pleotelson triangular, lamellar, apically narrowly rounded; ventrolateral margins of pleotelson flexed towards midline and meeting pleopod 1.

Antennular peduncle 4-segmented, segments 1 and 2 subequal in length,



Fig. 1. *Bathynatalia gilchristi*, ♀ in dorsal view.

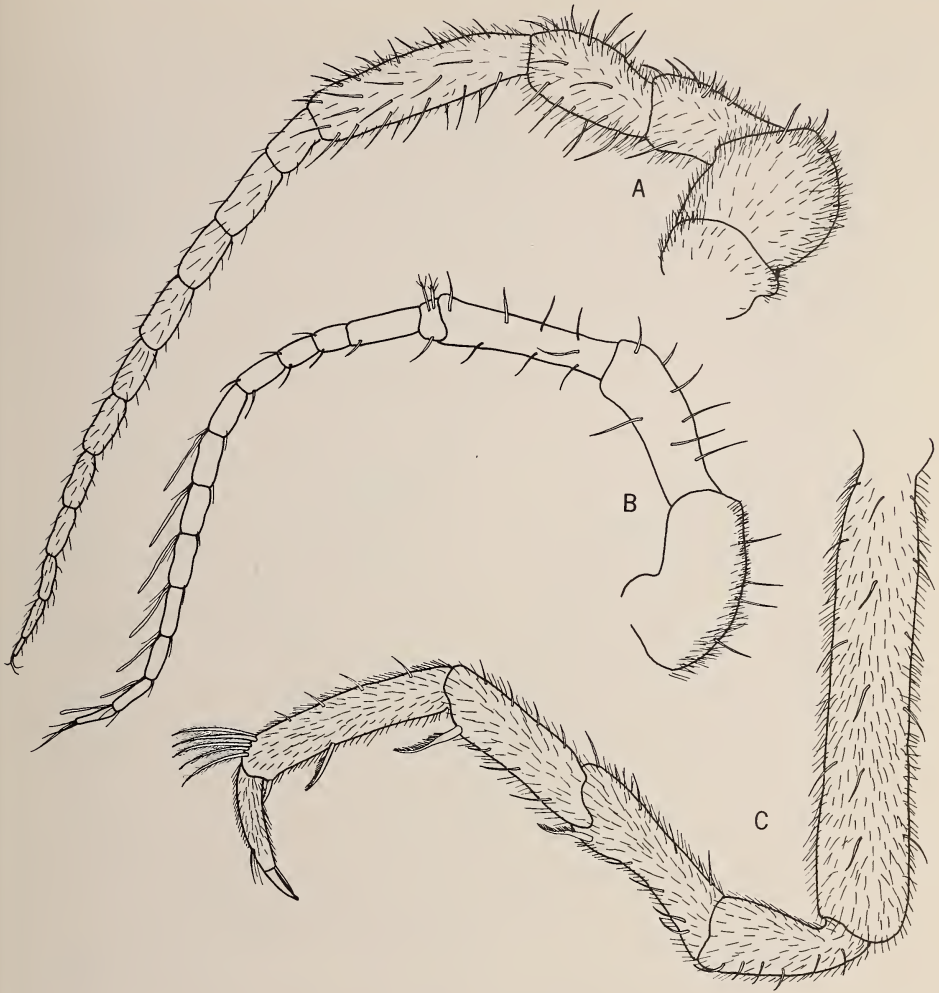


Fig. 2. *Bathynatalia gilchristi*. A. Antenna. B. Antennule. C. Pereopod 7.

segment 3 slightly longer and more slender, segment 4 one-fifth length of third; flagellum of twelve articles.

Antennal peduncle 5-segmented, segments 1 and 2 broad, 3 and 4 more slender, subequal in length, segment 5 one and one-half times longer than 4; flagellum of eleven articles.

Mandibles indurate; palp 3-segmented, first segment slightly less than half length of second, latter with eight distal finely-fringed spines, distal segment slender, one-third length of second, with seven distal finely-fringed spines; left mandibular incisor of four broad teeth separated by small gap from short conical spine; right mandible with incisor of four teeth separated by small gap from

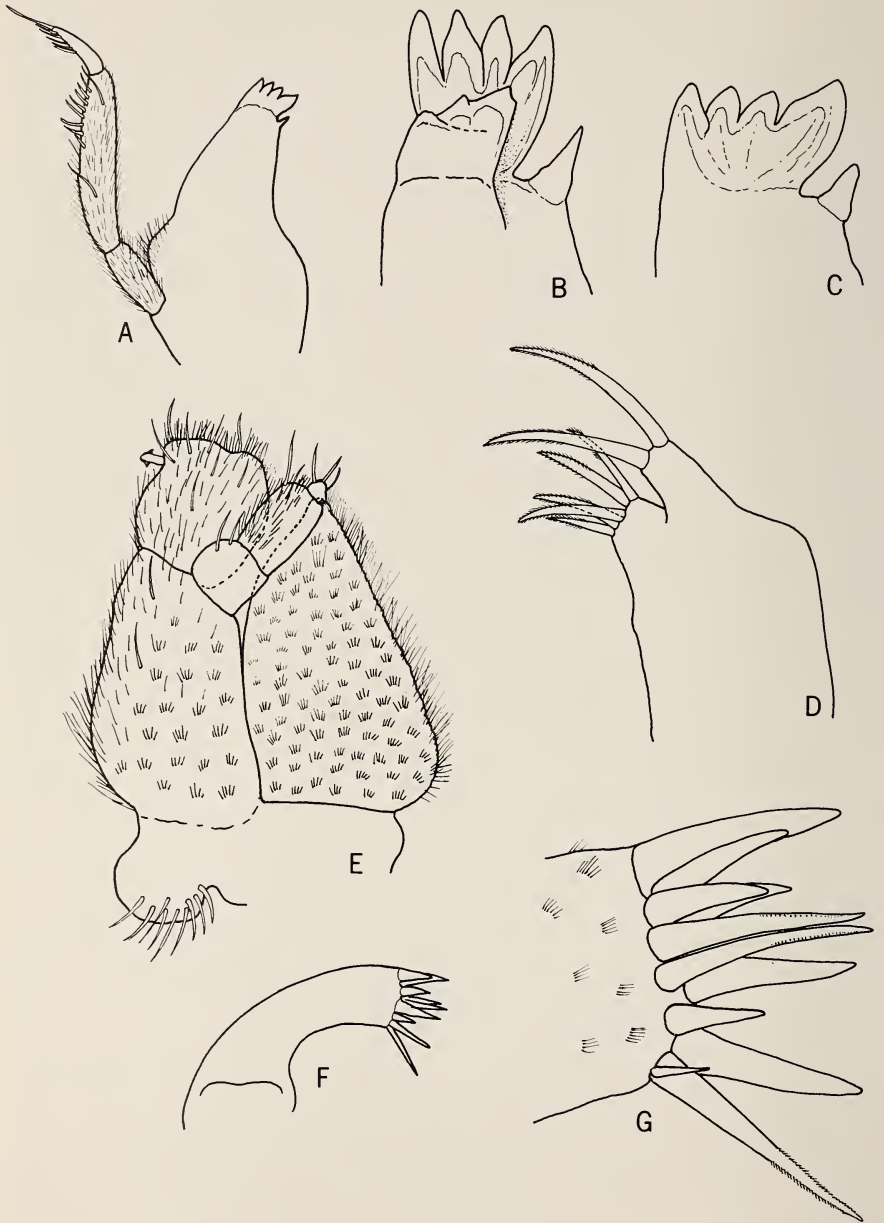


Fig. 3. *Bathynatalia gilchristi*. A. Left mandible. B. Apex of right mandible. C. Apex of left mandible. D. Maxilla 2. E. Maxilliped. F. Maxilla 1. G. Apex of maxilla 1.

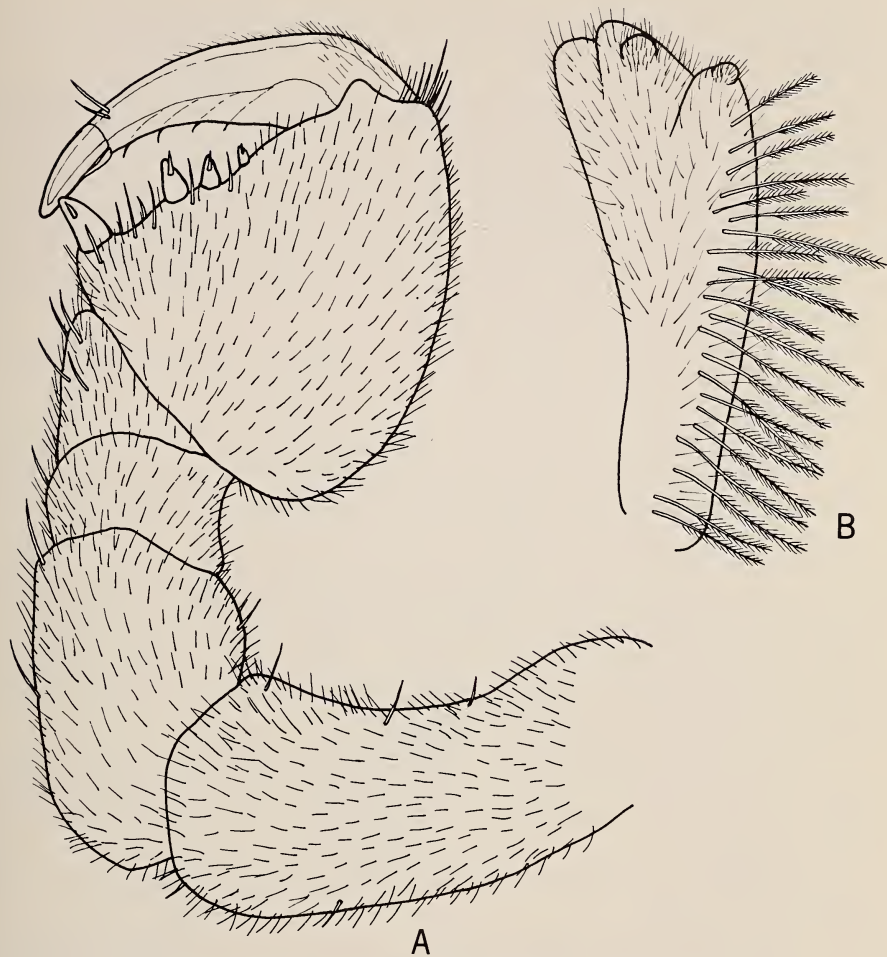


Fig. 4. *Bathynatalia gilchristi*. A. Pereopod 1. B. Uropod.

single conical spine at mediiodistal corner, with lacinia on inner face bearing three (four?) obscure teeth.

Maxilla 1 strongly curved and indurate, armed distally with ten large spines and one small spine, some of former distally finely serrate; no inner ramus present.

Maxilla 2 distally bilobed, upper lobe slightly narrower than lower, bearing two elongate serrate spines; lower lobe with five serrate spines. Exopod of maxilliped broadly triangular, posterior (outer) face with setae and fine setiferous scales; endite broader than palp, distal edge straight, with single strong coupling

hook on median margin; posterior face of palp and endite densely setose; palp 3-segmented, two proximal segments relatively broad, distal segment small, rounded.

Pereopod 1 robust, subchelate; dactylus meeting proximal spine on propodal palm; unguis about one-third dactylar length, with short spine at base; propodus proximally broad, palm with strong proximal spine plus three smaller spines; carpus, merus, and ischium together equal in length to basis.

Pereopods 2 to 7 similar, slender, ambulatory; unguis half length of dactylus; propodus with five elongate plumose setae anterodistally; strong posteroventral sensory spine present; carpus, merus, and ischium subequal in length, basis equal to propodus, carpus, and merus combined.

Marsupium formed by four pairs of oostegites on pereonites 1 to 4. (Although the marsupium was empty in the female dissected, the body cavity contained eight large incompletely-formed eggs.)

Pleopod 1 indurate, operculate, meeting ventral pleon margins and entirely closing off the branchial chamber; basis half length of rami, with two diverging ridges on anterior surface; exopod shorter and narrower than endopod, both rami with outer (anterior) surface hollowed.

Pleopod 2 with broad, almost square, basis bearing six retinaculæ; exopod shorter than endopod, lying obliquely across endopod, distally truncate, with twelve distal plumose setae, latter longer than ramus and flexed ventrally into distal narrowed channel of pleon; endopod distally truncate, with eleven or twelve elongate plumose setae, endopods of left and right side linked along median edge by row of small plate-like scales.

Pleopod 3 with basis enlarged on inner distal margin into broadly rounded lamella bearing two retinaculæ; endopod basally broad, tapering slightly, shorter than exopod; latter with suture in distal half, distally rounded with nine plumose setae.

Pleopods 4 and 5 similar, exopod of former with four plumose setae, of latter with two setae.

Uropod consisting of single segment, extending beyond pleotelsonic apex, broadening distally into three barely separated lobes, two outer lobes each bearing single small, rounded process; entire appendage bearing fine setules plus irregular longitudinal row of elongate plumose setae.

Male

Very similar to female, body of adult male slightly narrower than that of ovigerous female. Sternites of pereonites 2 to 7 with single pair of low spines along midline.

Pleopod 2 with exopod folded obliquely over endopod distally, with about ten distal plumose setae; endopod slightly longer than exopod, with eleven distal plumose setae; copulatory stylet extending from endopod base to slightly beyond apex, distally curved, apically rounded; basis with four retinaculæ in rounded mediodistal lobe.

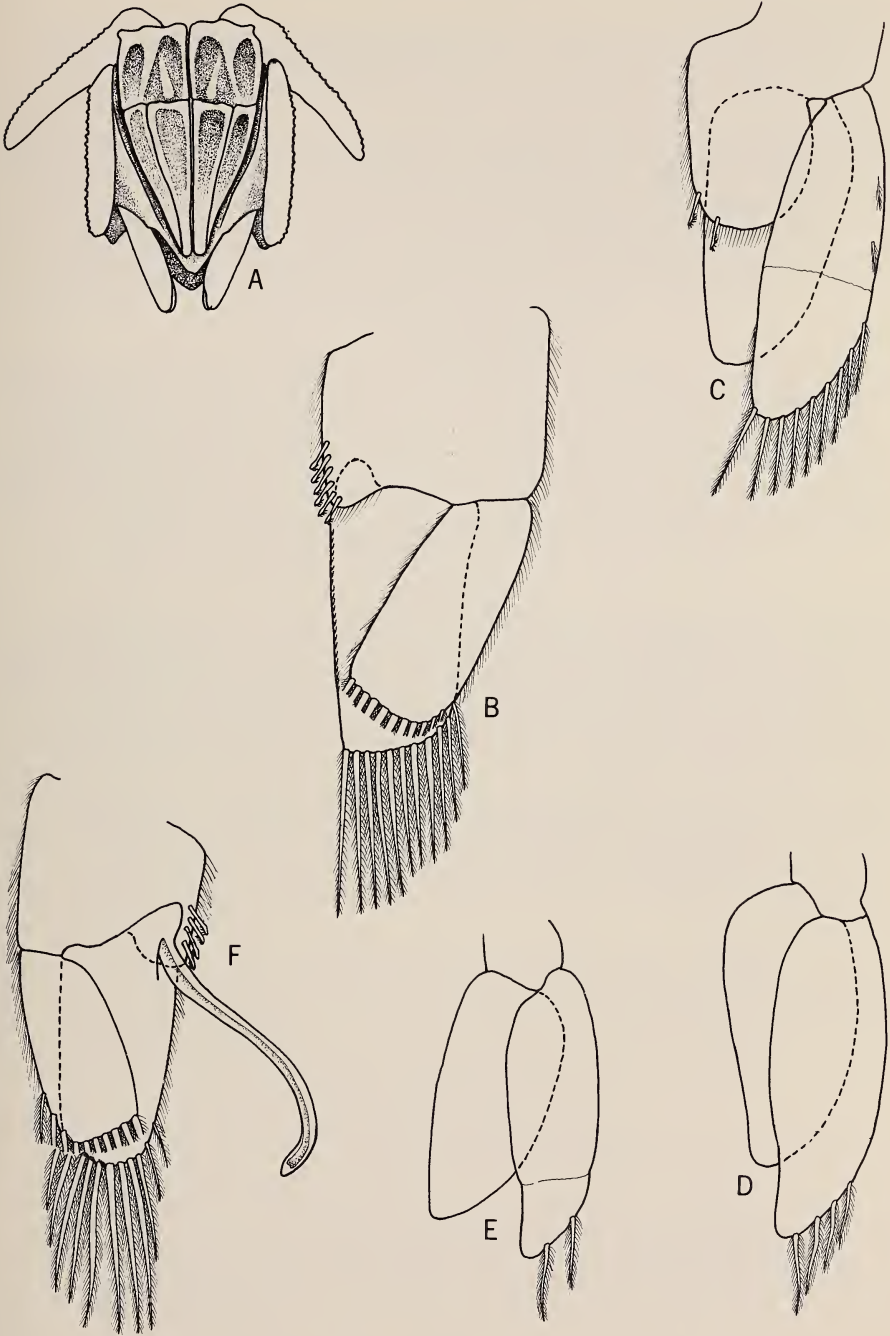


Fig. 5. *Bathynatalia gilchristi*. A. Pleon in ventral view, showing operculate first pleopods. B. Pleopod 2 ♀. C. Pleopod 3 ♀. D. Pleopod 4 ♀. E. Pleopod 5 ♀. F. Pleopod 2 ♂.

Previous Records

Holotype SAM-A10420, ♀ TL 6,5 mm, off Durban, 880 m, April 1901.

Material

Meiring Naude station SM 129 30°53'S 30°31'E (off Natal) 850 m, May 1977.

2 ♀♀ (with oostegites) TL 6,8 mm 6,9 mm

2 ♂♂ TL 4,8 mm 5,6 mm

5 juvs TL 2,9 mm-4,2 mm

ACKNOWLEDGEMENTS

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